



RE: ERMI reports for Call 3 and Call 4
Li, Charles to: Stephen Vesper

04/24/2009 04:33 PM

Hi, Steve,

Ok. I will issue the reports.

I only noticed that there are a lot of fungi being detected in the dusts, perhaps, samples from south, Kansas City.

A. versicolor is high in R95. I compared with national average, and the highest number. The ERMI values for the duplicate runs/R95 are close and comparable (within +/- 3 logs).

Thanks

Charlie
Quanyi" Charlie" Li Ph.D.
PCR Laboratory Director
EMSL Analytical, Inc
107 Haddon Ave, Westmont, NJ 08108
Tel: 800-220-3675 ext.1283
Fax: 856-858-0648
Email: cli@emsl.com

-----Original Message-----

From: vesper.stephen@epamail.epa.gov [
mailto:vesper.stephen@epamail.epa.gov]
Sent: Friday, April 24, 2009 1:12 PM
To: Li, Charles
Subject: Re: ERMI reports for Call 3 and Call 4

Hi Charlie,

I have not run these samples myself, so I do not know anything about them. However, I do not see any unusual results.

I was glad to see you picked-up A. ochraceous at least in one sample KC2607. So I hope that means everything is OK with that assay.

Thanks.

Steve

EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA

26 W.M. L. King Drive
Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 3

EMSL Order ID: 370903758

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-1	3758-2	3758-3	3758-4
Client Sample ID	KC2597	KC2598	KC2602	KC2607
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	17	6	ND	91
<i>Aspergillus ochraceus</i>	ND	ND	ND	533
<i>Aspergillus penicillioides</i>	ND	35	ND	ND
<i>Aspergillus restrictus</i>	ND	ND	4	4
<i>Aspergillus sclerotiorum</i>	15	8	14	7
<i>Aspergillus sydowii</i>	7	ND	167	75
<i>Aspergillus unguis</i>	4	2	3	13
<i>Aspergillus versicolor</i>	288	93	3,138	570
<i>Eurotium (A.) amstelodami</i>	139	58	437	991
<i>Aureobasidium pullulans</i>	1,368	1,261	4,323	12,167
<i>Chaetomium globosum</i>	6	3	20	10
<i>Cladosporium sphaerospermum</i>	32	8	88	93
<i>Paecilomyces variotii</i>	4	9	13	10
<i>Penicillium brevicompactum</i>	ND	ND	ND	ND
<i>Penicillium corylophilum</i>	139	ND	ND	304
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	ND	ND	ND	2
<i>Penicillium spinulosum</i>	ND	ND	ND	43
<i>Penicillium variable</i>	2	ND	9	5
<i>Scopulariopsis brevicaulis</i>	2	ND	6	ND
<i>Scopulariopsis chartarum</i>	ND	ND	1	ND
<i>Stachybotrys chartarum</i>	ND	ND	11	ND
<i>Trichoderma viride</i>	ND	17	ND	ND
<i>Wallemia sebi</i>	234	58	118	75
Sum of the Logs	19.5	15.6	23.4	30.0

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Lab Sample Number	3758-1	3758-2	3758-3	3758-4
Client Sample ID	KC2597	KC2598	KC2602	KC2607
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	7	11	3	8
<i>Alternaria alternata</i>	387	479	1,109	842
<i>Aspergillus ustus</i>	1	ND	14	14
<i>Cladosporium cladosporioides I</i>	428	498	545	595
<i>Cladosporium cladosporioides II</i>	ND	ND	7	10
<i>Cladosporium herbarum</i>	14	23	36	36
<i>Epicoccum nigrum</i>	531	1,227	4,938	ND
<i>Mucor and Rhizopus group</i>	302	6	ND	76
<i>Penicillium chrysogenum</i>	194	72	8	5
<i>Rhizopus stolonifer</i>	ND	ND	ND	ND
Sum of the Logs	14.8	13.5	14.4	12.9
ERMI Value:	5	2	9	17
ERMI Interpretation* (see graph and description below)	Level 3	Level 3	Level 4	Level 4

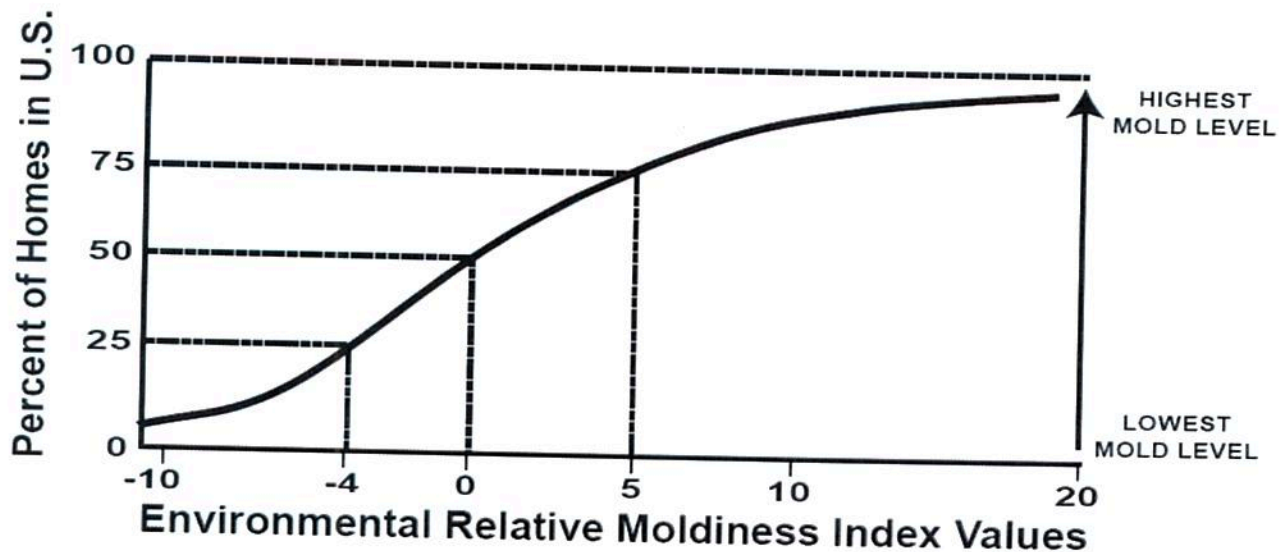
ND=None detected; the result is below the analytical detection limit or not present.



Charlie Li Ph.D., Lab Director

Or Approved EMSL Signatory

AIHA EMLAP Lab ID # 100194



Based on preliminary data published by the US EPA (chart above), the following ERMI levels can help predict whether an indoor environment is moldy. As research progresses, forthcoming data may change this interpretation and further refine the ERMI.

ND=None detected; the result is below the analytical detection limit or not present.

Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

Level 3 = Buildings with an ERMI in the 3rd quartile have a greater likelihood of having a mold problem.

Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

Level 1 = Buildings with an ERMI in the 1st quartile have the lowest likelihood of having a mold problem.

Related published paper: Quantification of *Stachybotrys chartarum* conidia in indoor dust using real time, fluorescent

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Quantitative Polymerase Chain Reaction Analysis of Fungi in Dust From Homes of Infants Who Developed Idiopathic Pulmonary Hemorrhaging. 2004. Vesper, Stephen J. PhD; Varma, Manju PhD; Wymer, Larry J. MS; Dearborn, Dorr G. MD, PhD; Sobolewski, John MS; Haugland, Richard A. PhD. *Journal of Occupational & Environmental Medicine*. 46(6):596-601.

Real-time PCR analysis of molds is performed at EMSL Analytical, Inc. in agreement with the Patent License Agreement between EMSL Analytical, Inc. and the United States Environmental Protection Agency's National Exposure and Research Laboratory-CI as well as the Patent License Agreement between EMSL Analytical, Inc. and Applied Biosystems.

For further technical information regarding the development of the Environmental Relative Moldiness Index refer to the April 2006 issue of "The Synergist" pages 39-43 or www.epa.gov/iaq

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Client: US EPA

26 W.M. L. King Drive
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Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 3

EMSL Order ID: 370903758

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Date Analyzed: 4/23/2009

Date Reported: 4/24/2009

4/20/2009

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based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-5	3758-6	3758-7	3758-8
Client Sample ID	KC2618	KC2620	KC2621	KC2624
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	48	15	110	2
<i>Aspergillus ochraceus</i>	ND	ND	92	ND
<i>Aspergillus penicillioides</i>	ND	ND	ND	11
<i>Aspergillus restrictus</i>	6	ND	12	ND
<i>Aspergillus sclerotiorum</i>	ND	ND	ND	10
<i>Aspergillus sydowii</i>	131	ND	122	7
<i>Aspergillus unguis</i>	ND	2	5	2
<i>Aspergillus versicolor</i>	1,698	165	2,721	194
<i>Eurotium (A.) amstelodami</i>	643	100	140	23
<i>Aureobasidium pullulans</i>	5,090	5,195	33,327	7,154
<i>Chaetomium globosum</i>	30	5	20	2
<i>Cladosporium sphaerospermum</i>	97	20	39	6
<i>Paecilomyces variotii</i>	7	ND	431	1
<i>Penicillium brevicompactum</i>	3	ND	ND	ND
<i>Penicillium corylophilum</i>	19	ND	120	7
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	ND	ND	ND	ND
<i>Penicillium spinulosum</i>	106	ND	89	ND
<i>Penicillium variable</i>	20	1	30	ND
<i>Scopulariopsis brevicaulis</i>	2	3	ND	ND
<i>Scopulariopsis chartarum</i>	3	ND	2	ND
<i>Stachybotrys chartarum</i>	5	ND	2	ND
<i>Trichoderma viride</i>	38	ND	62	1
<i>Wallemia sebi</i>	130	72	64	8
Sum of the Logs	28.9	13.9	33.2	13.8

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Lab Sample Number	3758-5	3758-6	3758-7	3758-8
Client Sample ID	KC2618	KC2620	KC2621	KC2624
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	17	6	5	10
<i>Alternaria alternata</i>	972	827	907	977
<i>Aspergillus ustus</i>	10	ND	27	6
<i>Cladosporium cladosporioides I</i>	746	678	1,908	1,344
<i>Cladosporium cladosporioides II</i>	ND	ND	7	ND
<i>Cladosporium herbarum</i>	49	25	34	80
<i>Epicoccum nigrum</i>	4,654	60	3,946	17,071
<i>Mucor and Rhizopus group</i>	63	1	20	1
<i>Penicillium chrysogenum</i>	214	131	8	3
<i>Rhizopus stolonifer</i>	ND	1	ND	4
Sum of the Logs	17.6	11.9	16.5	15.1
ERMI Value:	11	2	17	-1
ERMI Interpretation* (see graph and description below)	Level 4	Level 3	Level 4	Level 2

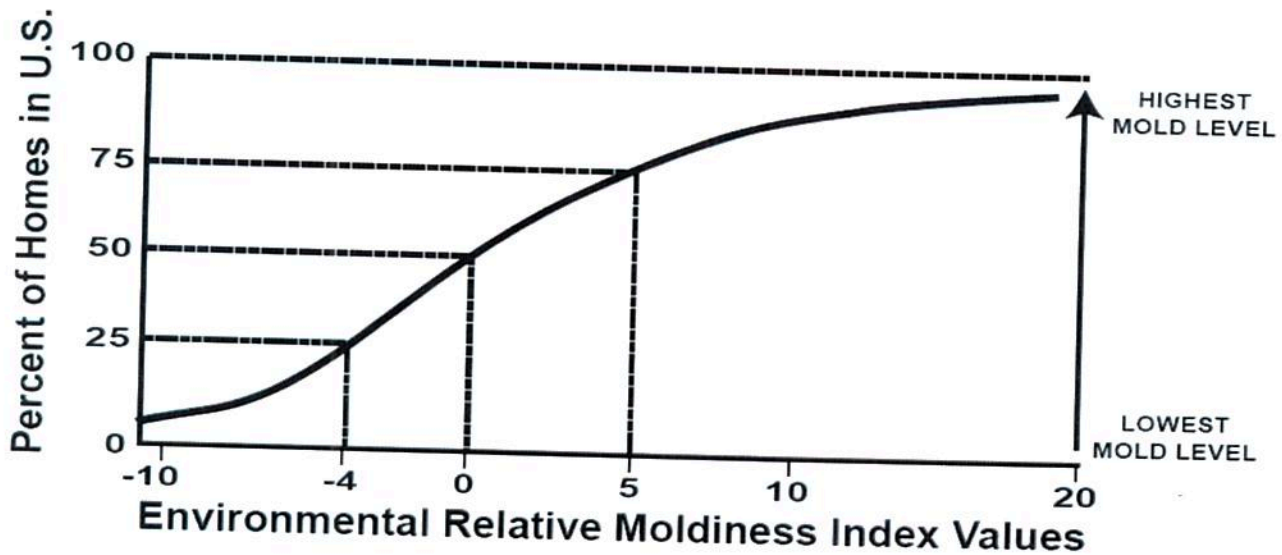
ND=None detected; the result is below the analytical detection limit or not present.



Charlie Li Ph.D., Lab Director

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For further technical information regarding the development of the Environmental Relative Moldiness Index refer to the April 2006 issue of "The Synergist" pages 39-43 or www.epa.gov/iaq

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26 W M. L. King Drive

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Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-9	3758-10	-	-
Client Sample ID	KC2626	KC2627	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	-	-
<i>Aspergillus fumigatus</i>	ND	ND	-	-
<i>Aspergillus niger</i>	6	14	-	-
<i>Aspergillus ochraceus</i>	ND	ND	-	-
<i>Aspergillus penicillioides</i>	22	30	-	-
<i>Aspergillus restrictus</i>	ND	ND	-	-
<i>Aspergillus sclerotiorum</i>	ND	2	-	-
<i>Aspergillus sydowii</i>	ND	21	-	-
<i>Aspergillus unguis</i>	ND	ND	-	-
<i>Aspergillus versicolor</i>	618	145	-	-
<i>Eurotium (A.) amstelodami</i>	30	91	-	-
<i>Aureobasidium pullulans</i>	2,407	1,589	-	-
<i>Chaetomium globosum</i>	ND	3	-	-
<i>Cladosporium sphaerospermum</i>	16	4	-	-
<i>Paecilomyces variotii</i>	ND	36	-	-
<i>Penicillium brevicompactum</i>	ND	ND	-	-
<i>Penicillium corylophilum</i>	ND	ND	-	-
<i>Penicillium crustosum (group2)</i>	ND	ND	-	-
<i>Penicillium purpurogenum</i>	ND	ND	-	-
<i>Penicillium spinulosum</i>	ND	28	-	-
<i>Penicillium variabile</i>	ND	2	-	-
<i>Scopulariopsis brevicaulis</i>	ND	ND	-	-
<i>Scopulariopsis chartarum</i>	1	ND	-	-
<i>Stachybotrys chartarum</i>	ND	ND	-	-
<i>Trichoderma viride</i>	ND	4	-	-
<i>Wallemia sebi</i>	14	2	-	-
Sum of the Logs	12.1	16.7	-	-

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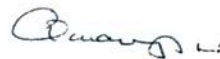
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based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-9	3758-10	-	-
Client Sample ID	KC2626	KC2627	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	1	3	-	-
<i>Alternaria alternata</i>	540	236	-	-
<i>Aspergillus ustus</i>	ND	ND	-	-
<i>Cladosporium cladosporioides I</i>	461	386	-	-
<i>Cladosporium cladosporioides II</i>	ND	ND	-	-
<i>Cladosporium herbarum</i>	29	26	-	-
<i>Epicoccum nigrum</i>	2,639	5,561	-	-
<i>Mucor and Rhizopus group</i>	ND	7	-	-
<i>Penicillium chrysogenum</i>	98	93	-	-
<i>Rhizopus stolonifer</i>	ND	ND	-	-
Sum of the Logs	12.3	13.4	-	-
ERMI Value:	0	3	-	-
ERMI Interpretation* (see graph and description below)	Level 2	Level 3	-	-

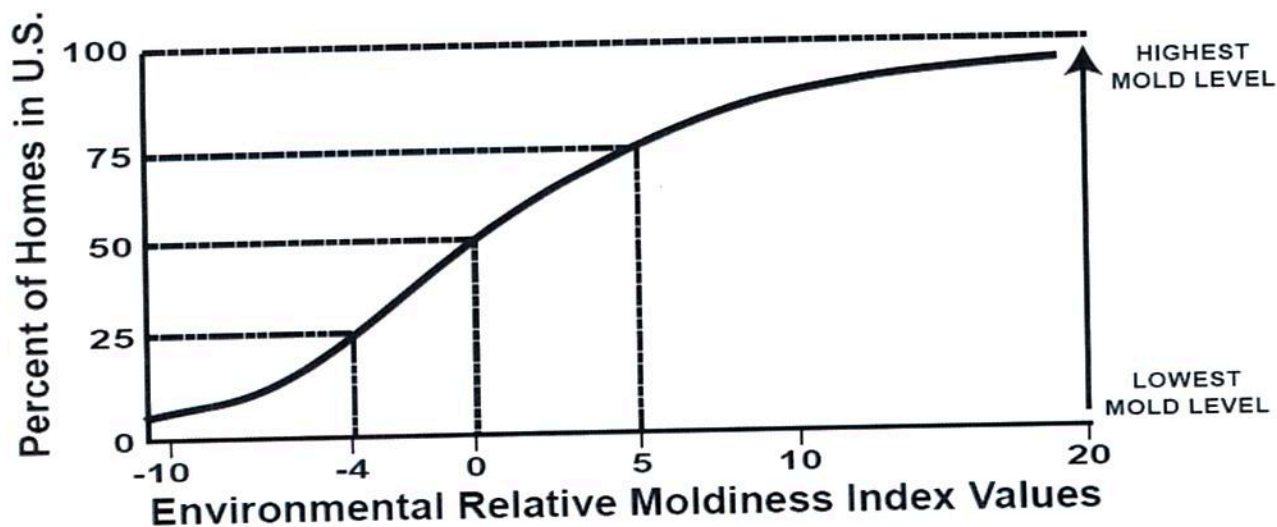
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Client Sample ID	KC2597	KC2598	KC2602	KC2607
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	17	6	ND	91
<i>Aspergillus ochraceus</i>	ND	ND	ND	533
<i>Aspergillus penicillioides</i>	ND	35	ND	ND
<i>Aspergillus restrictus</i>	ND	ND	4	4
<i>Aspergillus sclerotiorum</i>	15	8	14	7
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<i>Aspergillus unguis</i>	4	2	3	13
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<i>Penicillium purpurogenum</i>	ND	ND	ND	2
<i>Penicillium spinulosum</i>	ND	ND	ND	43
<i>Penicillium variable</i>	2	ND	9	5
<i>Scopulariopsis brevicaulis</i>	2	ND	6	ND
<i>Scopulariopsis chartarum</i>	ND	ND	1	ND
<i>Stachybotrys chartarum</i>	ND	ND	11	ND
<i>Trichoderma viride</i>	ND	17	ND	ND
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Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-1	3758-2	3758-3	3758-4
Client Sample ID	KC2597	KC2598	KC2602	KC2607
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	7	11	3	8
<i>Alternaria alternata</i>	387	479	1,109	842
<i>Aspergillus ustus</i>	1	ND	14	14
<i>Cladosporium cladosporioides I</i>	428	498	545	595
<i>Cladosporium cladosporioides II</i>	ND	ND	7	10
<i>Cladosporium herbarum</i>	14	23	36	36
<i>Epicoccum nigrum</i>	531	1,227	4,938	ND
<i>Mucor and Rhizopus group</i>	302	6	ND	76
<i>Penicillium chrysogenum</i>	194	72	8	5
<i>Rhizopus stolonifer</i>	ND	ND	ND	ND
Sum of the Logs	14.8	13.5	14.4	12.9
ERMI Value:	5	2	9	17
ERMI Interpretation* (see graph and description below)	Level 3	Level 3	Level 4	Level 4

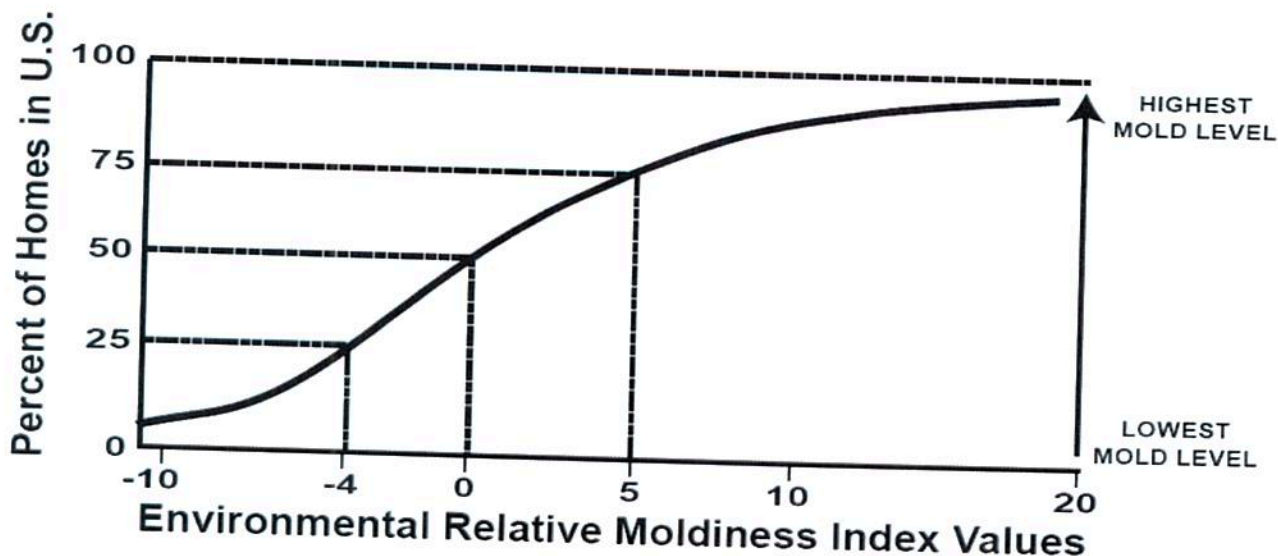
ND=None detected; the result is below the analytical detection limit or not present.



Charlie Li Ph.D., Lab Director

Or Approved EMSL Signatory

AIHA EMLAP Lab ID # 100194



Based on preliminary data published by the US EPA (chart above), the following ERMI levels can help predict whether an indoor environment is moldy. As research progresses, forthcoming data may change this interpretation and further refine the ERMI.

ND=None detected; the result is below the analytical detection limit or not present.

Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

Level 3 = Buildings with an ERMI in the 3rd quartile have a greater likelihood of having a mold problem.

Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

Level 1 = Buildings with an ERMI in the 1st quartile have the lowest likelihood of having a mold problem.

Related published paper: Quantification of *Stachybotrys chartarum* conidia in indoor dust using real time, fluorescent

Rapid Monitoring by Quantitative Polymerase Chain Reaction for Pathogenic *Aspergillus* During Carpet Removal From a Hospital. 2004. Alice N. Neely, PhD, Vince Gallardo, MS, Ed Barth, MS, Richard A. Haugland, PhD, Glenn D. Warden, MD, and Stephen J. Vesper, PhD. *Infection Control and Hospital Epidemiology*, Vol. 25.

Quantitative Polymerase Chain Reaction Analysis of Fungi in Dust From Homes of Infants Who Developed Idiopathic Pulmonary Hemorrhaging. 2004. Vesper, Stephen J. PhD; Varma, Manju PhD; Wymer, Larry J. MS; Dearborn, Dorr G. MD, PhD; Sobolewski, John MS; Haugland, Richard A. PhD. *Journal of Occupational & Environmental Medicine*. 46(6):596-601.

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For further technical information regarding the development of the Environmental Relative Moldiness Index refer to the April 2006 issue of "The Synergist" pages 39-43 or www.epa.gov/iaq

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EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA

26 W.M. L. King Drive
Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 3

EMSL Order ID: 370903758

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

Date Reported: 4/24/2009
4/20/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-5	3758-6	3758-7	3758-8
Client Sample ID	KC2618	KC2620	KC2621	KC2624
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	48	15	110	2
<i>Aspergillus ochraceus</i>	ND	ND	92	ND
<i>Aspergillus penicillioides</i>	ND	ND	ND	11
<i>Aspergillus restrictus</i>	6	ND	12	ND
<i>Aspergillus sclerotiorum</i>	ND	ND	ND	10
<i>Aspergillus sydowii</i>	131	ND	122	7
<i>Aspergillus unguis</i>	ND	2	5	2
<i>Aspergillus versicolor</i>	1,698	165	2,721	194
<i>Eurotium (A.) amstelodami</i>	643	100	140	23
<i>Aureobasidium pullulans</i>	5,090	5,195	33,327	7,154
<i>Chaetomium globosum</i>	30	5	20	2
<i>Cladosporium sphaerospermum</i>	97	20	39	6
<i>Paecilomyces variotii</i>	7	ND	431	1
<i>Penicillium brevicompactum</i>	3	ND	ND	ND
<i>Penicillium corylophilum</i>	19	ND	120	7
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	ND	ND	ND	ND
<i>Penicillium spinulosum</i>	106	ND	89	ND
<i>Penicillium variable</i>	20	1	30	ND
<i>Scopulariopsis brevicaulis</i>	2	3	ND	ND
<i>Scopulariopsis chartarum</i>	3	ND	2	ND
<i>Stachybotrys chartarum</i>	5	ND	2	ND
<i>Trichoderma viride</i>	38	ND	62	1
<i>Wallemia sebi</i>	130	72	64	8
Sum of the Logs	28.9	13.9	33.2	13.8

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Project: Kansas City (KC), Call # 3

EMSL Order ID: 370903758
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Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number Client Sample ID Sample Location Sample size	3758-5 KC2618 - 5mg Dust	3758-6 KC2620 - 5mg Dust	3758-7 KC2621 - 5mg Dust	3758-8 KC2624 - 5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	17	6	5	10
<i>Alternaria alternata</i>	972	827	907	977
<i>Aspergillus ustus</i>	10	ND	27	6
<i>Cladosporium cladosporioides I</i>	746	678	1,908	1,344
<i>Cladosporium cladosporioides II</i>	ND	ND	7	ND
<i>Cladosporium herbarum</i>	49	25	34	80
<i>Epicoccum nigrum</i>	4,654	60	3,946	17,071
<i>Mucor and Rhizopus group</i>	63	1	20	1
<i>Penicillium chrysogenum</i>	214	131	8	3
<i>Rhizopus stolonifer</i>	ND	1	ND	4
Sum of the Logs	17.6	11.9	16.5	15.1
ERMI Value:	11	2	17	-1
ERMI Interpretation* (see graph and description below)	Level 4	Level 3	Level 4	Level 2

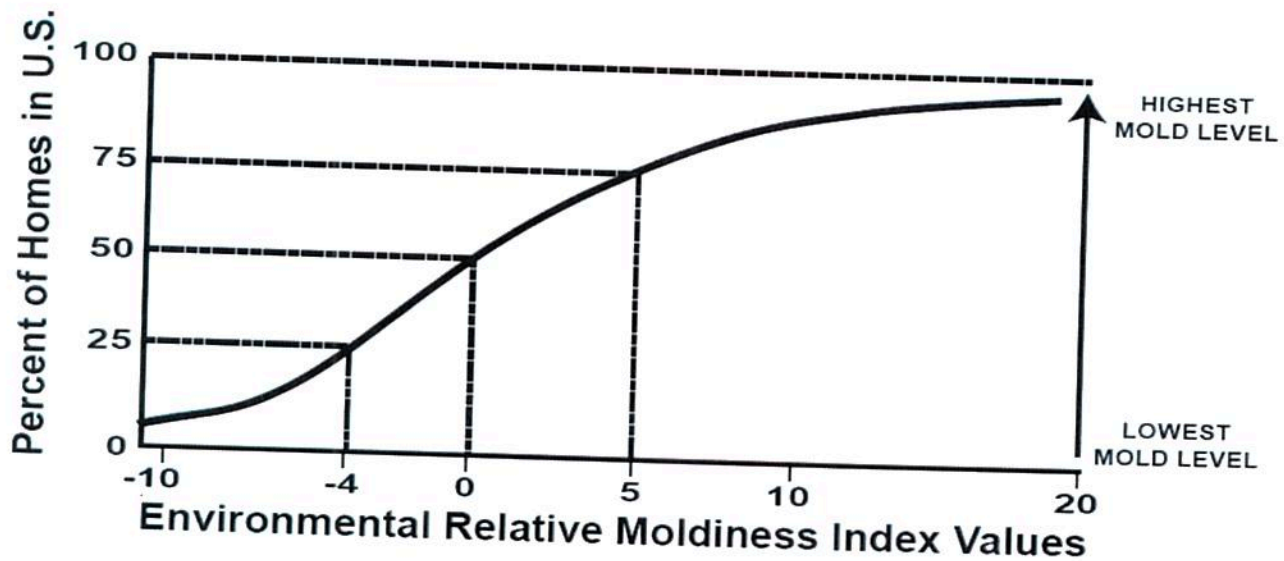
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Charlie Li Ph.D., Lab Director

Or Approved EMSL Signatory

AIHA EMLAP Lab ID # 100194



Based on preliminary data published by the US EPA (chart above), the following ERMI levels can help predict whether an indoor environment is moldy. As research progresses, forthcoming data may change this interpretation and further refine the ERMI.

ND=None detected; the result is below the analytical detection limit or not present.

Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

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Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

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EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA

26 W M. L. King Drive
Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 3

EMSL Order ID: 370903758

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-9	3758-10	-	-
Client Sample ID	KC2626	KC2627	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	-	-
<i>Aspergillus fumigatus</i>	ND	ND	-	-
<i>Aspergillus niger</i>	6	14	-	-
<i>Aspergillus ochraceus</i>	ND	ND	-	-
<i>Aspergillus penicillioides</i>	22	30	-	-
<i>Aspergillus restrictus</i>	ND	ND	-	-
<i>Aspergillus sclerotiorum</i>	ND	2	-	-
<i>Aspergillus sydowii</i>	ND	21	-	-
<i>Aspergillus unguis</i>	ND	ND	-	-
<i>Aspergillus versicolor</i>	618	145	-	-
<i>Eurotium (A.) amstelodami</i>	30	91	-	-
<i>Aureobasidium pullulans</i>	2,407	1,589	-	-
<i>Chaetomium globosum</i>	ND	3	-	-
<i>Cladosporium sphaerospermum</i>	16	4	-	-
<i>Paecilomyces variotii</i>	ND	36	-	-
<i>Penicillium brevicompactum</i>	ND	ND	-	-
<i>Penicillium corylophilum</i>	ND	ND	-	-
<i>Penicillium crustosum (group2)</i>	ND	ND	-	-
<i>Penicillium purpurogenum</i>	ND	ND	-	-
<i>Penicillium spinulosum</i>	ND	28	-	-
<i>Penicillium variable</i>	ND	2	-	-
<i>Scopulariopsis brevicaulis</i>	ND	ND	-	-
<i>Scopulariopsis chartarum</i>	1	ND	-	-
<i>Stachybotrys chartarum</i>	ND	ND	-	-
<i>Trichoderma viride</i>	ND	4	-	-
<i>Wallemia sebi</i>	14	2	-	-
Sum of the Logs	12.1	16.7	-	-

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based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-9	3758-10	-	-
Client Sample ID	KC2626	KC2627	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification				
Group 2	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
<i>Acremonium strictum</i>	1	3	-	-
<i>Alternaria alternata</i>	540	236	-	-
<i>Aspergillus ustus</i>	ND	ND	-	-
<i>Cladosporium cladosporioides I</i>	461	386	-	-
<i>Cladosporium cladosporioides II</i>	ND	ND	-	-
<i>Cladosporium herbarum</i>	29	26	-	-
<i>Epicoccum nigrum</i>	2,639	5,561	-	-
<i>Mucor and Rhizopus group</i>	ND	7	-	-
<i>Penicillium chrysogenum</i>	98	93	-	-
<i>Rhizopus stolonifer</i>	ND	ND	-	-
Sum of the Logs	12.3	13.4	-	-
ERMI Value:	0	3	-	-
ERMI Interpretation* (see graph and description below)	Level 2	Level 3	-	-

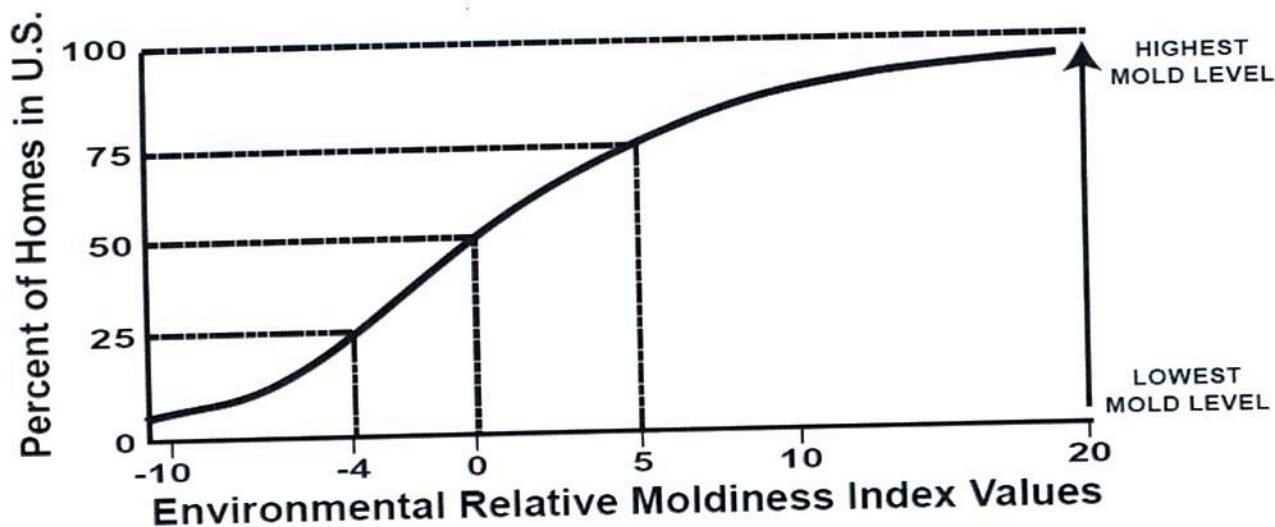
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Charlie Li Ph.D., Lab Director

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AIHA EMLAP Lab ID # 100194



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ND=None detected; the result is below the analytical detection limit or not present.

Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

Level 3 = Buildings with an ERMI in the 3rd quartile have a greater likelihood of having a mold problem.

Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

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Client: US EPA

26 W M. L. King Drive

Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 4

EMSL Order ID: 370903782

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number Client Sample ID Sample Location Sample size	3782-1 KC2632 - 5mg Dust	3782-2 KC2636 - 5mg Dust	3782-3 KC2643 - 5mg Dust	3782-4 KC2644 - 5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	8	4	ND	9
<i>Aspergillus ochraceus</i>	ND	ND	ND	ND
<i>Aspergillus penicillioides</i>	ND	ND	51	8
<i>Aspergillus restrictus</i>	ND	ND	ND	ND
<i>Aspergillus sclerotiorum</i>	ND	12	12	7
<i>Aspergillus sydowii</i>	ND	6	ND	10
<i>Aspergillus unguis</i>	ND	ND	1	ND
<i>Aspergillus versicolor</i>	645	358	269	102
<i>Eurotium (A.) amstelodami</i>	285	15	35	78
<i>Aureobasidium pullulans</i>	1,557	1,123	1,923	7,154
<i>Chaetomium globosum</i>	3	5	ND	5
<i>Cladosporium sphaerospermum</i>	10	19	10	2
<i>Paecilomyces variotii</i>	13	1	ND	ND
<i>Penicillium brevicompactum</i>	ND	ND	ND	ND
<i>Penicillium corylophilum</i>	27	ND	12	ND
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	21	ND	ND	ND
<i>Penicillium spinulosum</i>	ND	31	ND	ND
<i>Penicillium variabile</i>	ND	ND	ND	1
<i>Scopulariopsis brevicaulis</i>	1	ND	1	2
<i>Scopulariopsis chartarum</i>	ND	ND	ND	ND
<i>Stachybotrys chartarum</i>	ND	ND	ND	1
<i>Trichoderma viride</i>	ND	5	116	2
<i>Wallemia sebi</i>	21	4	4	20
Sum of the Logs	16.2	13.9	15.0	14.6

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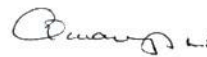
EMSL Order ID: 370903782
Date Received: 4/22/2009
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Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3782-1	3782-2	3782-3	3782-4
Client Sample ID	KC2632	KC2636	KC2643	KC2644
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	2	5	9	3
<i>Alternaria alternata</i>	995	359	333	586
<i>Aspergillus ustus</i>	22	2	ND	1
<i>Cladosporium cladosporioides I</i>	416	862	461	572
<i>Cladosporium cladosporioides II</i>	ND	ND	7	6
<i>Cladosporium herbarum</i>	25	28	25	56
<i>Epicoccum nigrum</i>	21	3,646	2,913	3,768
<i>Mucor and Rhizopus group</i>	4	ND	16	32
<i>Penicillium chrysogenum</i>	99	38	2	3
<i>Rhizopus stolonifer</i>	ND	ND	ND	ND
Sum of the Logs	12.7	12.9	13.4	14.1
ERMI Value:	4	1	2	1
ERMI Interpretation* (see graph and description below)	Level 3	Level 3	Level 3	Level 3

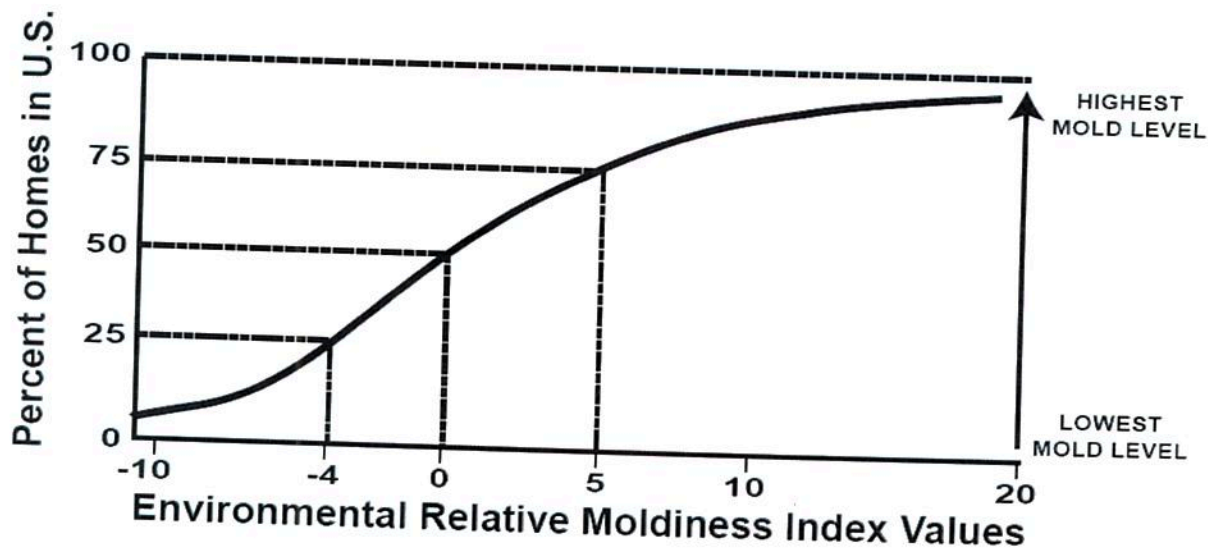
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Level 3 = Buildings with an ERMI in the 3rd quartile have a greater likelihood of having a mold problem.

Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

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Project: Kansas City (KC), Call # 4

EMSL Order ID: 370903782
Date Received: 4/22/2009
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4/20/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number Client Sample ID Sample Location Sample size	3782-5 KC2645 - 5mg Dust	3782-6 KC2651 - 5mg Dust	3782-7 KC2655 - 5mg Dust	3782-8 R63 - 5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	40	13	ND	37
<i>Aspergillus ochraceus</i>	ND	ND	ND	ND
<i>Aspergillus penicillioides</i>	52	45	5	ND
<i>Aspergillus restrictus</i>	3	ND	ND	14
<i>Aspergillus sclerotiorum</i>	6	8	3	7
<i>Aspergillus sydowii</i>	11	11	ND	7
<i>Aspergillus unguis</i>	ND	1	ND	1
<i>Aspergillus versicolor</i>	1,134	288	116	304
<i>Eurotium (A.) amstelodami</i>	184	20	6	1,163
<i>Aureobasidium pullulans</i>	17,693	1,304	304	4,627
<i>Chaetomium globosum</i>	5	3	ND	9
<i>Cladosporium sphaerospermum</i>	11	7	1	9
<i>Paecilomyces variotii</i>	ND	27	ND	8
<i>Penicillium brevicompactum</i>	7	ND	ND	ND
<i>Penicillium corylophilum</i>	60	29	ND	144
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	ND	ND	ND	ND
<i>Penicillium spinulosum</i>	ND	32	ND	87
<i>Penicillium variable</i>	3	2	ND	2
<i>Scopulariopsis brevicaulis</i>	1	ND	ND	5
<i>Scopulariopsis chartarum</i>	ND	ND	ND	3
<i>Stachybotrys chartarum</i>	ND	ND	ND	ND
<i>Trichoderma viride</i>	24	2	ND	14
<i>Wallemia sebi</i>	17	4	15	251
Sum of the Logs	22.6	18.7	7.7	25.6

EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA

26 W M. L. King Drive

Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 4

EMSL Order ID: 370903782

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

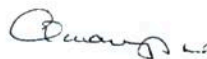
Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number Client Sample ID Sample Location Sample size	3782-5 KC2645 - 5mg Dust	3782-6 KC2651 - 5mg Dust	3782-7 KC2655 - 5mg Dust	3782-8 R63 - 5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	11	3	ND	15
<i>Alternaria alternata</i>	490	374	73	387
<i>Aspergillus ustus</i>	1	14	ND	ND
<i>Cladosporium cladosporioides I</i>	682	1,393	47	414
<i>Cladosporium cladosporioides II</i>	ND	ND	ND	44
<i>Cladosporium herbarum</i>	97	35	37	11
<i>Epicoccum nigrum</i>	2,503	5,940	228	1,922
<i>Mucor and Rhizopus group</i>	142	5	ND	1
<i>Penicillium chrysogenum</i>	103	184	ND	5
<i>Rhizopus stolonifer</i>	ND	ND	ND	ND
Sum of the Logs	16.2	15.5	7.5	13.2
ERMI Value:	6	3	0	12
ERMI Interpretation* (see graph and description below)	Level 4	Level 3	Level 3	Level 4

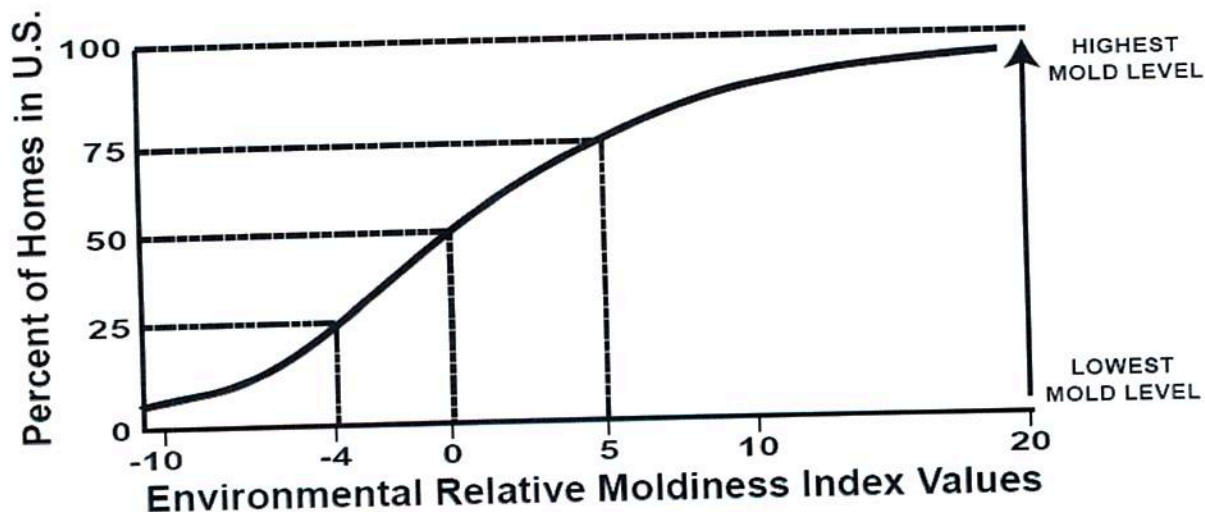
ND=None detected; the result is below the analytical detection limit or not present.



Charlie Li Ph.D., Lab Director

Or Approved EMSL Signatory

AIHA EMLAP Lab ID # 100194



Based on preliminary data published by the US EPA (chart above), the following ERMI levels can help predict whether an indoor environment is moldy. As research progresses, forthcoming data may change this interpretation and further refine the ERMI.

ND=None detected; the result is below the analytical detection limit or not present.

Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

Level 3 = Buildings with an ERMI in the 3rd quartile have a greater likelihood of having a mold problem.

Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

Level 1 = Buildings with an ERMI in the 1st quartile have the lowest likelihood of having a mold problem.

Related published paper: Quantification of *Stachybotrys chartarum* conidia in indoor dust using real time,

Rapid Monitoring by Quantitative Polymerase Chain Reaction for Pathogenic *Aspergillus* During Carpet Removal From a Hospital. 2004. Alice N. Neely, PhD, Vince Gallardo, MS, Ed Barth, MS, Richard A. Haugland, PhD, Glenn D. Warden, MD, and Stephen J. Vesper,

Quantitative Polymerase Chain Reaction Analysis of Fungi in Dust From Homes of Infants Who Developed Idiopathic Pulmonary Hemorrhaging. 2004. Vesper, Stephen J. PhD; Varma, Manju PhD; Wymer, Larry J. MS; Dearborn, Dorr G. MD, PhD; Sobolewski, John MS; Hau

Real-time PCR analysis of molds is performed at EMSL Analytical, Inc. in agreement with the Patent License Agreement between EMSL Analytical, Inc. and the United States Environmental Protection Agency's National Exposure and Research Laboratory-CI as well

For further technical information regarding the development of the Environmental Relative Moldiness Index refer to the April 2006 issue of "The Synergist" pages 39-43 or www.epa.gov/iaq

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EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA

26 W M. L. King Drive

Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 4

EMSL Order ID: 370903782

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

Date Reported: 4/24/2009

4/20/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3782-9	3782-10	-	-
Client Sample ID	R95	R95	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	-	-
<i>Aspergillus fumigatus</i>	ND	ND	-	-
<i>Aspergillus niger</i>	114	108	-	-
<i>Aspergillus ochraceus</i>	ND	ND	-	-
<i>Aspergillus penicillioides</i>	561	2,274	-	-
<i>Aspergillus restrictus</i>	ND	ND	-	-
<i>Aspergillus sclerotiorum</i>	10	ND	-	-
<i>Aspergillus sydowii</i>	14	42	-	-
<i>Aspergillus unguis</i>	19	19	-	-
<i>Aspergillus versicolor</i>	7,388	12,994	-	-
<i>Eurotium (A.) amstelodami</i>	276	321	-	-
<i>Aureobasidium pullulans</i>	263	360	-	-
<i>Chaetomium globosum</i>	832	124	-	-
<i>Cladosporium sphaerospermum</i>	2	4	-	-
<i>Paecilomyces variotii</i>	ND	ND	-	-
<i>Penicillium brevicompactum</i>	ND	ND	-	-
<i>Penicillium corylophilum</i>	ND	13	-	-
<i>Penicillium crustosum (group2)</i>	ND	ND	-	-
<i>Penicillium purpurogenum</i>	2	1	-	-
<i>Penicillium spinulosum</i>	ND	ND	-	-
<i>Penicillium variabile</i>	ND	ND	-	-
<i>Scopulariopsis brevicaulis</i>	2	5	-	-
<i>Scopulariopsis chartarum</i>	1	2	-	-
<i>Stachybotrys chartarum</i>	ND	ND	-	-
<i>Trichoderma viride</i>	2	ND	-	-
<i>Wallemia sebi</i>	363	780	-	-
Sum of the Logs	23.4	25.2	-	-

EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA
26 W M. L. King Drive
Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 4

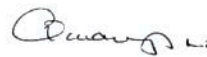
EMSL Order ID: 370903782
Date Received: 4/22/2009
Date Analyzed: 4/23/2009
Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3782-9	3782-10	-	-
Client Sample ID	R95	R95	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	ND	2	-	-
<i>Alternaria alternata</i>	54	106	-	-
<i>Aspergillus ustus</i>	44	34	-	-
<i>Cladosporium cladosporioides I</i>	81	86	-	-
<i>Cladosporium cladosporioides II</i>	ND	ND	-	-
<i>Cladosporium herbarum</i>	8	9	-	-
<i>Epicoccum nigrum</i>	337	335	-	-
<i>Mucor and Rhizopus group</i>	212	192	-	-
<i>Penicillium chrysogenum</i>	687	455	-	-
<i>Rhizopus stolonifer</i>	15	6	-	-
Sum of the Logs	15.0	14.9	-	-
ERMI Value:	8	10	-	-
ERMI Interpretation* (see graph and description below)	Level 4	Level 4	-	-

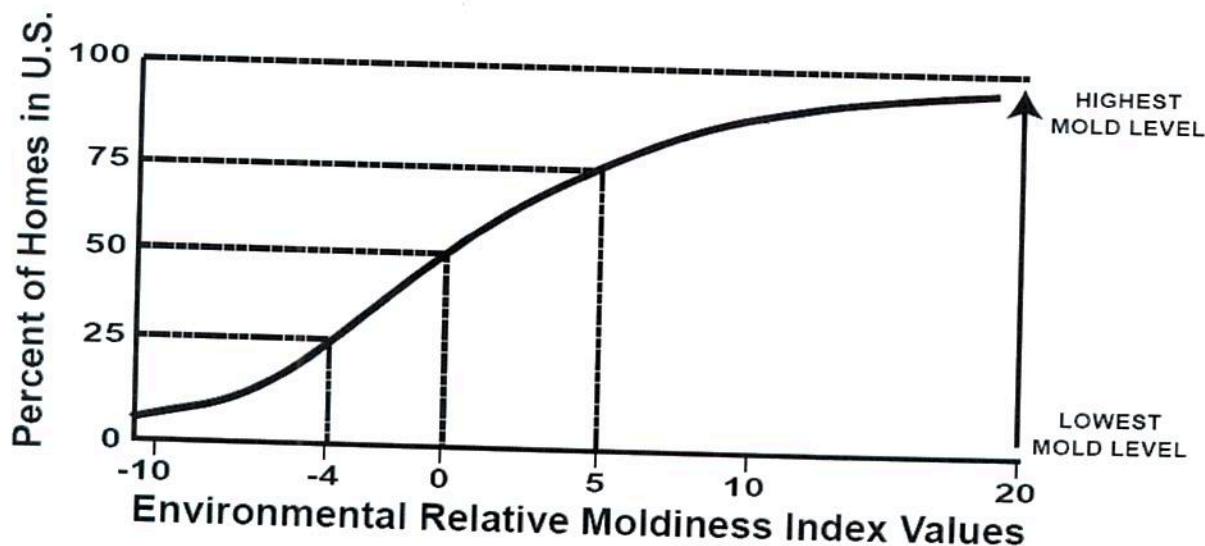
ND=None detected; the result is below the analytical detection limit or not present.



Charlie Li Ph.D., Lab Director

Or Approved EMSL Signatory

AIHA EMLAP Lab ID # 100194



Based on preliminary data published by the US EPA (chart above), the following ERMI levels can help predict whether an indoor environment is moldy. As research progresses, forthcoming data may change this interpretation and further refine the ERMI.

ND=None detected; the result is below the analytical detection limit or not present.

Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

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Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

Level 1 = Buildings with an ERMI in the 1st quartile have the lowest likelihood of having a mold problem.

Related published paper: Quantification of *Stachybotrys chartarum* conidia in indoor dust using real time,

Rapid Monitoring by Quantitative Polymerase Chain Reaction for Pathogenic *Aspergillus* During Carpet Removal From a Hospital. 2004. Alice N. Neely, PhD, Vince Gallardo, MS, Ed Barth, MS, Richard A. Haugland, PhD, Glenn D. Warden, MD, and Stephen J. Vesper,

Quantitative Polymerase Chain Reaction Analysis of Fungi in Dust From Homes of Infants Who Developed Idiopathic Pulmonary Hemorrhaging. 2004. Vesper, Stephen J. PhD; Varma, Manju PhD; Wymer, Larry J. MS; Dearborn, Dorr G. MD, PhD; Sobolewski, John MS; Hau

Real-time PCR analysis of molds is performed at EMSL Analytical, Inc. in agreement with the Patent License Agreement between EMSL Analytical, Inc. and the United States Environmental Protection Agency's National Exposure and Research Laboratory-CI as well

For further technical information regarding the development of the Environmental Relative Moldiness Index refer to the April 2006 issue of "The Synergist" pages 39-43 or www.epa.gov/iaq

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EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA

26 W.M. L. King Drive

Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 4

EMSL Order ID: 370903782

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number Client Sample ID Sample Location Sample size	3782-1 KC2632 - 5mg Dust	3782-2 KC2636 - 5mg Dust	3782-3 KC2643 - 5mg Dust	3782-4 KC2644 - 5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	8	4	ND	9
<i>Aspergillus ochraceus</i>	ND	ND	ND	ND
<i>Aspergillus penicillioides</i>	ND	ND	51	8
<i>Aspergillus restrictus</i>	ND	ND	ND	ND
<i>Aspergillus sclerotiorum</i>	ND	12	12	7
<i>Aspergillus sydowii</i>	ND	6	ND	10
<i>Aspergillus unguis</i>	ND	ND	1	ND
<i>Aspergillus versicolor</i>	645	358	269	102
<i>Eurotium (A.) amstelodami</i>	285	15	35	78
<i>Aureobasidium pullulans</i>	1,557	1,123	1,923	7,154
<i>Chaetomium globosum</i>	3	5	ND	5
<i>Cladosporium sphaerospermum</i>	10	19	10	2
<i>Paecilomyces variotii</i>	13	1	ND	ND
<i>Penicillium brevicompactum</i>	ND	ND	ND	ND
<i>Penicillium corylophilum</i>	27	ND	12	ND
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	21	ND	ND	ND
<i>Penicillium spinulosum</i>	ND	31	ND	ND
<i>Penicillium variable</i>	ND	ND	ND	1
<i>Scopulariopsis brevicaulis</i>	1	ND	1	2
<i>Scopulariopsis chartarum</i>	ND	ND	ND	ND
<i>Stachybotrys chartarum</i>	ND	ND	ND	1
<i>Trichoderma viride</i>	ND	5	116	2
<i>Wallemia sebi</i>	21	4	4	20
Sum of the Logs	16.2	13.9	15.0	14.6

EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA
26 W.M. L. King Drive
Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 4

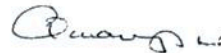
EMSL Order ID: 370903782
Date Received: 4/22/2009
Date Analyzed: 4/23/2009
Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3782-1	3782-2	3782-3	3782-4
Client Sample ID	KC2632	KC2636	KC2643	KC2644
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	2	5	9	3
<i>Alternaria alternata</i>	995	359	333	586
<i>Aspergillus ustus</i>	22	2	ND	1
<i>Cladosporium cladosporioides I</i>	416	862	461	572
<i>Cladosporium cladosporioides II</i>	ND	ND	7	6
<i>Cladosporium herbarum</i>	25	28	25	56
<i>Epicoccum nigrum</i>	21	3,646	2,913	3,768
<i>Mucor and Rhizopus group</i>	4	ND	16	32
<i>Penicillium chrysogenum</i>	99	38	2	3
<i>Rhizopus stolonifer</i>	ND	ND	ND	ND
Sum of the Logs	12.7	12.9	13.4	14.1
ERMI Value:	4	1	2	1
ERMI Interpretation* (see graph and description below)	Level 3	Level 3	Level 3	Level 3

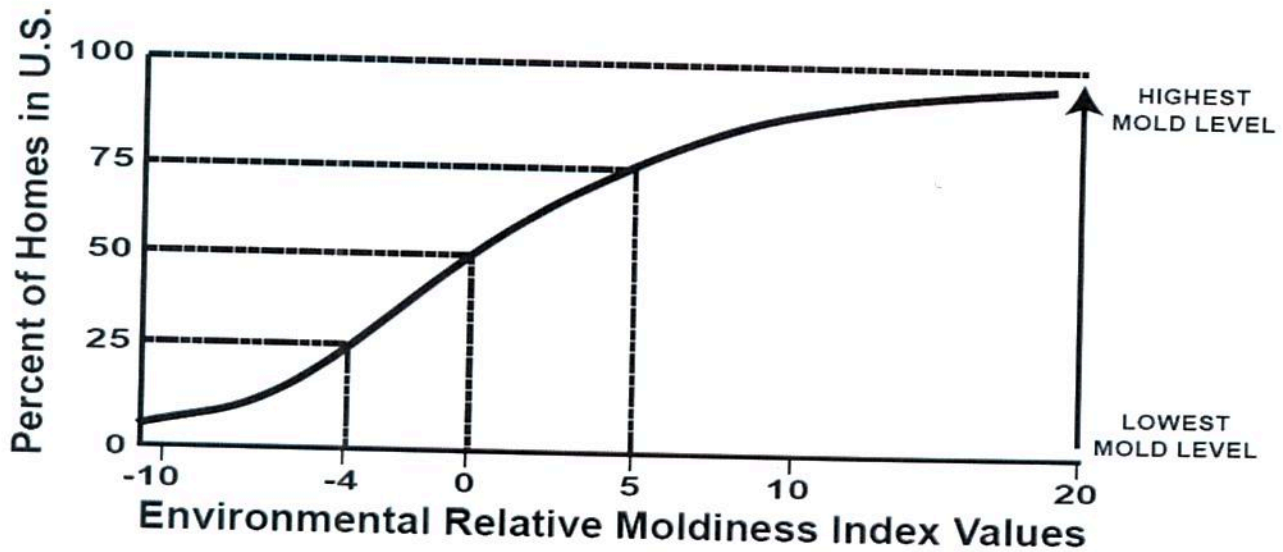
ND=None detected; the result is below the analytical detection limit or not present.



Charlie Li Ph.D., Lab Director

Or Approved EMSL Signatory

AIHA EMLAP Lab ID # 100194



Based on preliminary data published by the US EPA (chart above), the following ERMI levels can help predict whether an indoor environment is moldy. As research progresses, forthcoming data may change this interpretation and further refine the ERMI.

ND=None detected; the result is below the analytical detection limit or not present.

Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

Level 3 = Buildings with an ERMI in the 3rd quartile have a greater likelihood of having a mold problem.

Level 2 = Buildings with an ERMI in the 2nd quartile have a lower likelihood of having a mold problem.

Level 1 = Buildings with an ERMI in the 1st quartile have the lowest likelihood of having a mold problem.

Related published paper: Quantification of *Stachybotrys chartarum* conidia in indoor dust using real time, fluorescent

Rapid Monitoring by Quantitative Polymerase Chain Reaction for Pathogenic *Aspergillus* During Carpet Removal From a Hospital. 2004. Alice N. Neely, PhD, Vince Gallardo, MS, Ed Barth, MS, Richard A. Haugland, PhD, Glenn D. Warden, MD, and Stephen J. Vesper, PhD. *Infection Control and Hospital Epidemiology*, Vol. 25.

Quantitative Polymerase Chain Reaction Analysis of Fungi in Dust From Homes of Infants Who Developed Idiopathic Pulmonary Hemorrhaging. 2004. Vesper, Stephen J. PhD; Varma, Manju PhD; Wymer, Larry J. MS; Dearborn, Dorr G. MD, PhD; Sobolewski, John MS; Haugland, Richard A. PhD. *Journal of Occupational & Environmental Medicine*. 46(6):596-601.

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For further technical information regarding the development of the Environmental Relative Moldiness Index refer to the April 2006 issue of "The Synergist" pages 39-43 or www.epa.gov/iaq

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EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA

26 W M. L. King Drive

Cincinnati, OH 45268

Attention: Dr. Steve Vesper

Project: Kansas City (KC), Call # 3

EMSL Order ID: 370903758

Date Received: 4/22/2009

Date Analyzed: 4/23/2009

Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number Client Sample ID Sample Location Sample size	3758-1 KC2597 - 5mg Dust	3758-2 KC2598 - 5mg Dust	3758-3 KC2602 - 5mg Dust	3758-4 KC2607 - 5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	17	6	ND	91
<i>Aspergillus ochraceus</i>	ND	ND	ND	533
<i>Aspergillus penicillioides</i>	ND	35	ND	ND
<i>Aspergillus restrictus</i>	ND	ND	4	4
<i>Aspergillus sclerotiorum</i>	15	8	14	7
<i>Aspergillus sydowii</i>	7	ND	167	75
<i>Aspergillus unguis</i>	4	2	3	13
<i>Aspergillus versicolor</i>	288	93	3,138	570
<i>Eurotium (A.) amstelodami</i>	139	58	437	991
<i>Aureobasidium pullulans</i>	1,368	1,261	4,323	12,167
<i>Chaetomium globosum</i>	6	3	20	10
<i>Cladosporium sphaerospermum</i>	32	8	88	93
<i>Paecilomyces variotii</i>	4	9	13	10
<i>Penicillium brevicompactum</i>	ND	ND	ND	ND
<i>Penicillium corylophilum</i>	139	ND	ND	304
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	ND	ND	ND	2
<i>Penicillium spinulosum</i>	ND	ND	ND	43
<i>Penicillium variable</i>	2	ND	9	5
<i>Scopulariopsis brevicaulis</i>	2	ND	6	ND
<i>Scopulariopsis chartarum</i>	ND	ND	1	ND
<i>Stachybotrys chartarum</i>	ND	ND	11	ND
<i>Trichoderma viride</i>	ND	17	ND	ND
<i>Wallemia sebi</i>	234	58	118	75
Sum of the Logs	19.5	15.6	23.4	30.0

EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA
26 W M. L. King Drive
Cincinnati, OH 45268

Attention: Dr. Steve Vesper
Project: Kansas City (KC), Call # 3

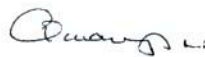
EMSL Order ID: 370903758
Date Received: 4/22/2009
Date Analyzed: 4/23/2009
Date Reported: 4/24/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-1	3758-2	3758-3	3758-4
Client Sample ID	KC2597	KC2598	KC2602	KC2607
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	7	11	3	8
<i>Alternaria alternata</i>	387	479	1,109	842
<i>Aspergillus ustus</i>	1	ND	14	14
<i>Cladosporium cladosporioides I</i>	428	498	545	595
<i>Cladosporium cladosporioides II</i>	ND	ND	7	10
<i>Cladosporium herbarum</i>	14	23	36	36
<i>Epicoccum nigrum</i>	531	1,227	4,938	ND
<i>Mucor and Rhizopus group</i>	302	6	ND	76
<i>Penicillium chrysogenum</i>	194	72	8	5
<i>Rhizopus stolonifer</i>	ND	ND	ND	ND
Sum of the Logs	14.8	13.5	14.4	12.9
ERMI Value:	5	2	9	17
ERMI Interpretation* (see graph and description below)	Level 3	Level 3	Level 4	Level 4

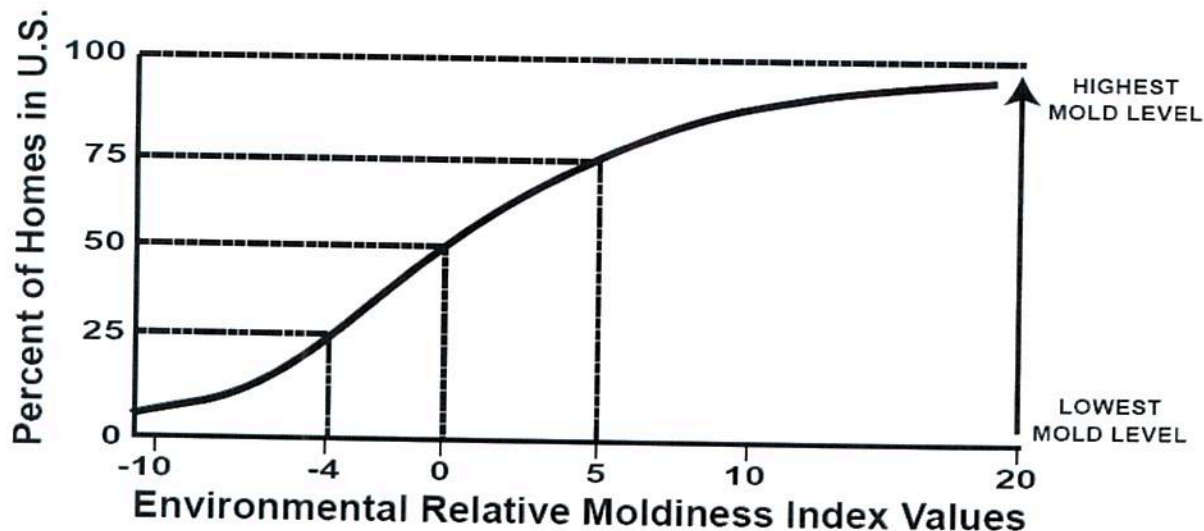
ND=None detected; the result is below the analytical detection limit or not present.



Charlie Li Ph.D., Lab Director

Or Approved EMSL Signatory

AIHA EMLAP Lab ID # 100194



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Quantitative Polymerase Chain Reaction Analysis of Fungi in Dust From Homes of Infants Who Developed Idiopathic Pulmonary Hemorrhaging. 2004. Vesper, Stephen J. PhD; Varma, Manju PhD; Wymer, Larry J. MS; Dearborn, Dorr G. MD, PhD; Sobolewski, John MS; Haugland, Richard A. PhD. *Journal of Occupational & Environmental Medicine*. 46(6):596-601.

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For further technical information regarding the development of the Environmental Relative Moldiness Index refer to the April 2006 issue of "The Synergist" pages 39-43 or www.epa.gov/iaq

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EMSL Analytical, Inc. - Microbiology

107 Haddon Ave., Westmont, NJ 08108 Tel: 800-220-3675 Fax: 856-858-0648

Client: US EPA
26 W M. L. King Drive
Cincinnati, OH 45268
Attention: Dr. Steve Vesper
Project: Kansas City (KC), Call # 3

EMSL Order ID: 370903758
Date Received: 4/22/2009
Date Analyzed: 4/23/2009
Date Reported: 4/24/2009
4/20/2009

Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-5	3758-6	3758-7	3758-8
Client Sample ID	KC2618	KC2620	KC2621	KC2624
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	ND	ND
<i>Aspergillus fumigatus</i>	ND	ND	ND	ND
<i>Aspergillus niger</i>	48	15	110	2
<i>Aspergillus ochraceus</i>	ND	ND	92	ND
<i>Aspergillus penicillioides</i>	ND	ND	ND	11
<i>Aspergillus restrictus</i>	6	ND	12	ND
<i>Aspergillus sclerotiorum</i>	ND	ND	ND	10
<i>Aspergillus sydowii</i>	131	ND	122	7
<i>Aspergillus unguis</i>	ND	2	5	2
<i>Aspergillus versicolor</i>	1,698	165	2,721	194
<i>Eurotium (A.) amstelodami</i>	643	100	140	23
<i>Aureobasidium pullulans</i>	5,090	5,195	33,327	7,154
<i>Chaetomium globosum</i>	30	5	20	2
<i>Cladosporium sphaerospermum</i>	97	20	39	6
<i>Paecilomyces variotii</i>	7	ND	431	1
<i>Penicillium brevicompactum</i>	3	ND	ND	ND
<i>Penicillium corylophilum</i>	19	ND	120	7
<i>Penicillium crustosum (group2)</i>	ND	ND	ND	ND
<i>Penicillium purpurogenum</i>	ND	ND	ND	ND
<i>Penicillium spinulosum</i>	106	ND	89	ND
<i>Penicillium variable</i>	20	1	30	ND
<i>Scopulariopsis brevicaulis</i>	2	3	ND	ND
<i>Scopulariopsis chartarum</i>	3	ND	2	ND
<i>Stachybotrys chartarum</i>	5	ND	2	ND
<i>Trichoderma viride</i>	38	ND	62	1
<i>Wallemia sebi</i>	130	72	64	8
Sum of the Logs	28.9	13.9	33.2	13.8

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Project: Kansas City (KC), Call # 3

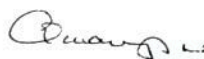
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Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Method:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-5	3758-6	3758-7	3758-8
Client Sample ID	KC2618	KC2620	KC2621	KC2624
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	5mg Dust	5mg Dust
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	17	6	5	10
<i>Alternaria alternata</i>	972	827	907	977
<i>Aspergillus ustus</i>	10	ND	27	6
<i>Cladosporium cladosporioides I</i>	746	678	1,908	1,344
<i>Cladosporium cladosporioides II</i>	ND	ND	7	ND
<i>Cladosporium herbarum</i>	49	25	34	80
<i>Epicoccum nigrum</i>	4,654	60	3,946	17,071
<i>Mucor and Rhizopus group</i>	63	1	20	1
<i>Penicillium chrysogenum</i>	214	131	8	3
<i>Rhizopus stolonifer</i>	ND	1	ND	4
Sum of the Logs	17.6	11.9	16.5	15.1
ERMI Value:	11	2	17	-1
ERMI Interpretation* (see graph and description below)	Level 4	Level 3	Level 4	Level 2

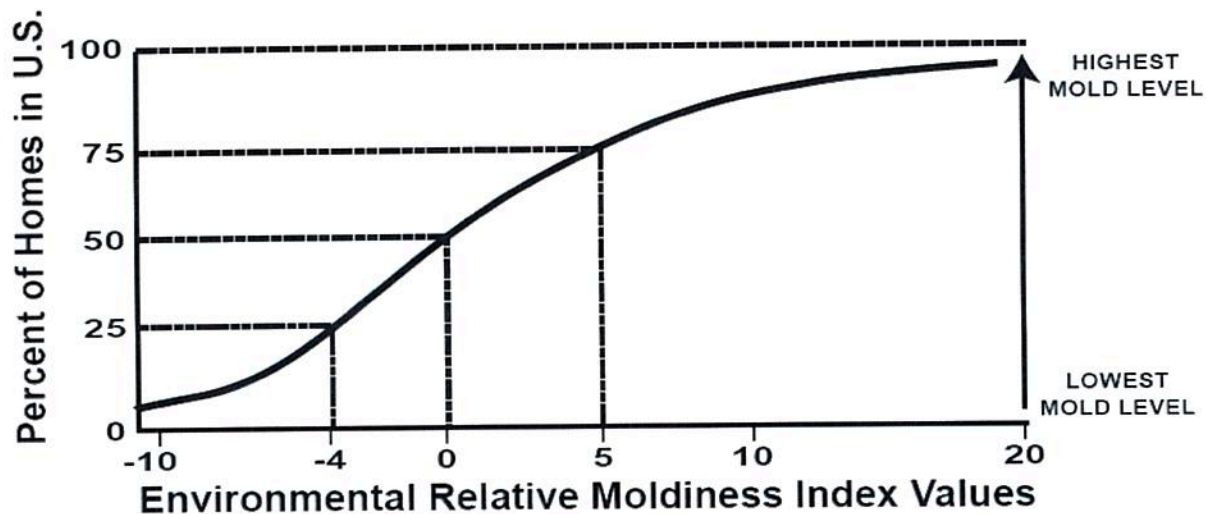
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Level 4 = Buildings with an ERMI in the 4th quartile have the greatest likelihood of having a mold problem.

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Environmental Relative Moldiness Index (ERMI) by Mold Specific Quantitative Polymerase Chain Reaction (MSQPCR) (EMSL Test Code:M050)

based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-9	3758-10	-	-
Client Sample ID	KC2626	KC2627	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 1				
<i>Aspergillus flavus</i>	ND	ND	-	-
<i>Aspergillus fumigatus</i>	ND	ND	-	-
<i>Aspergillus niger</i>	6	14	-	-
<i>Aspergillus ochraceus</i>	ND	ND	-	-
<i>Aspergillus penicillioides</i>	22	30	-	-
<i>Aspergillus restrictus</i>	ND	ND	-	-
<i>Aspergillus sclerotiorum</i>	ND	2	-	-
<i>Aspergillus sydowii</i>	ND	21	-	-
<i>Aspergillus unguis</i>	ND	ND	-	-
<i>Aspergillus versicolor</i>	618	145	-	-
<i>Eurotium (A.) amstelodami</i>	30	91	-	-
<i>Aureobasidium pullulans</i>	2,407	1,589	-	-
<i>Chaetomium globosum</i>	ND	3	-	-
<i>Cladosporium sphaerospermum</i>	16	4	-	-
<i>Paecilomyces variotii</i>	ND	36	-	-
<i>Penicillium brevicompactum</i>	ND	ND	-	-
<i>Penicillium corylophilum</i>	ND	ND	-	-
<i>Penicillium crustosum (group2)</i>	ND	ND	-	-
<i>Penicillium purpurogenum</i>	ND	ND	-	-
<i>Penicillium spinulosum</i>	ND	28	-	-
<i>Penicillium variable</i>	ND	2	-	-
<i>Scopulariopsis brevicaulis</i>	ND	ND	-	-
<i>Scopulariopsis chartarum</i>	1	ND	-	-
<i>Stachybotrys chartarum</i>	ND	ND	-	-
<i>Trichoderma viride</i>	ND	4	-	-
<i>Wallemia sebi</i>	14	2	-	-
Sum of the Logs	12.1	16.7	-	-

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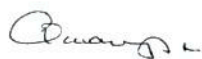
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based on USA EPA SOP MERB-020, Revision No. 3, 7/11/02

Lab Sample Number	3758-9	3758-10	-	-
Client Sample ID	KC2626	KC2627	-	-
Sample Location	-	-	-	-
Sample size	5mg Dust	5mg Dust	-	-
EPA 36 Species Identification	cells/ mg dust	cells/ mg dust	cells/ mg dust	cells/ mg dust
Group 2				
<i>Acremonium strictum</i>	1	3	-	-
<i>Alternaria alternata</i>	540	236	-	-
<i>Aspergillus ustus</i>	ND	ND	-	-
<i>Cladosporium cladosporioides I</i>	461	386	-	-
<i>Cladosporium cladosporioides II</i>	ND	ND	-	-
<i>Cladosporium herbarum</i>	29	26	-	-
<i>Epicoccum nigrum</i>	2,639	5,561	-	-
<i>Mucor and Rhizopus group</i>	ND	7	-	-
<i>Penicillium chrysogenum</i>	98	93	-	-
<i>Rhizopus stolonifer</i>	ND	ND	-	-
Sum of the Logs	12.3	13.4	-	-
ERMI Value:	0	3	-	-
ERMI Interpretation* (see graph and description below)	Level 2	Level 3	-	-

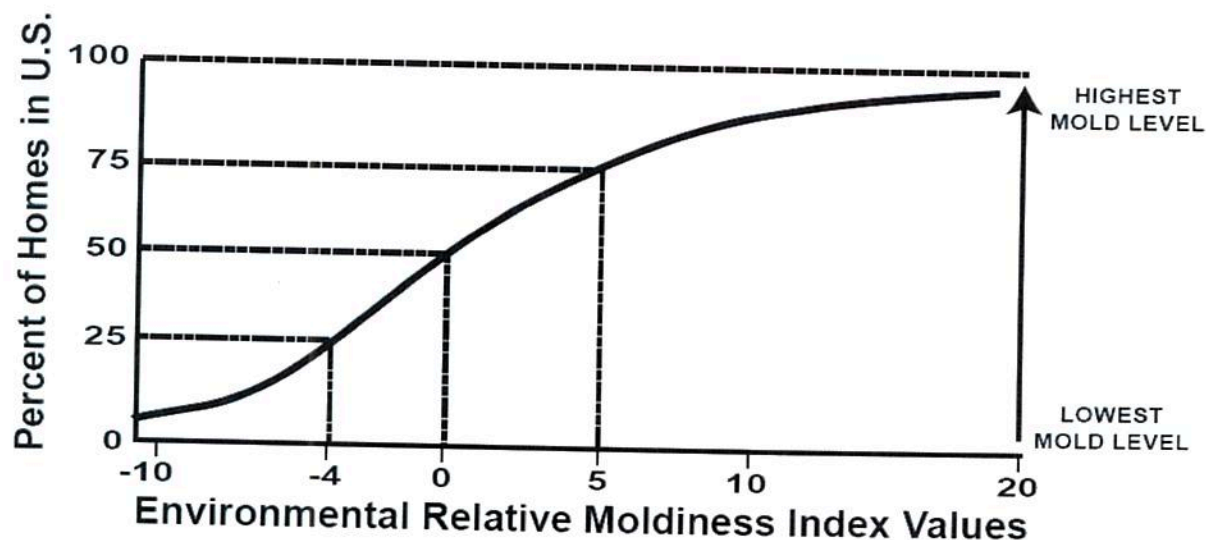
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